Estimated Life Cycle Costs for Reengineering the 2010 Decennial Census Program

Revised
September 2005
Incorporates the President's FY 2006 Budget

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Introduction

In June 2001, the U.S. Census Bureau issued the document, "Potential Life Cycle Savings for the 2010 Census," to describe the goals and process for reengineering the 2010 Decennial Census Program and to provide a cost comparison for that approach to one that would repeat the Census 2000 approach. The document noted that the cost figures included were based on preliminary planning assumptions and were subject to change as we moved through the decade with planning, development, testing, and implementation.

In June 2003, an update on the Census life cycle was issued to provide revised estimates of life cycle costs. This revision benefited from the experience of over two years of Census re-engineering progress, and was able to more accurately predict costs based on work performed as of that date. Since that time, re-engineering has continued in accordance with 2010 goals. The Census Bureau continually assesses its performance against these goals and evaluates the resources required for a successful Census in 2010. As planning and infrastructure investments are made throughout the cycle, more accurate predictions of total cycle costs can be produced.

This document outlines the most recent updates to life cycle cost estimates, which the Census Bureau will now publish on an annual basis for the duration of the cycle. In order to establish a comparable reference point for these annual estimates, these updates will be issued each year to correspond with the President's annual budget request to the Congress beginning with the fiscal year 2007 budget. This year's update reflects the President's FY2006 request and is compared to the estimated life cycle costs as of the President's FY2005 request.

Estimated Life Cycle Costs as of President's FY2006 Budget Request:

The September 2005 revised estimated life cycle costs for reengineering the 2010 Decennial Census Program are shown, by component program, in Table 1. The estimates reflect actual appropriations through FY2005, and the President's budget request to the Congress for FY2006.

As with previous estimated life cycle cost estimates, these figures include:

- ACS costs from FY 2001 (nationwide testing program) through FY 2012 (when five-year averages centered on 2010 can be produced with equivalent reliability to Census 2000 long-form data).
- MAF/TIGER Enhancement Program costs from inception in FY 2002 through FY 2012.
- 2010 Census costs from FY 2002 through FY 2013.

Table 1: Revised Estimated Life Cycle Costs for the 2010 Decennial Census Program (nominal year dollars in millions)

Program Component	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Enacted	FY 2004 Enacted	FY 2005 Enacted	FY 2006 Request	Subtotal FY01-06	FY 2007-FY 2013 (est.)	Total (est.)
American Community Survey	$23.6	$29.0	$56.8	$64.1	$144.1	$169.9	$487.5	$1,219.8	$1,707.3
MAF/TIGER Enhancements Program	$0	$15.0	$47.0	$82.4	$81.2	$79.8	$305.4	$228.9	$534.3
2010 Census	$0	$21.0	$41.6	$106.0	$163.0	$214.5	$546.1	$8,466.8	$9,012.9
TOTAL	$23.6	$65.0	$145.4	$252.5	$388.3	$464.3	1,339.0	$9,915.5	$11,254.6

Details may not add to totals due to rounding.

The life cycle cost for the entire 2010 Decennial Census Program now is estimated to be $11.255 billion in nominal dollars. Only about 12% of this total will have been spent through the end of FY 2006. Overall, the 2010 Census itself still accounts for approximately 80% of the estimated life cycle cost, and for 85% of the estimated cost for FY 2007 – FY 2013.

Comparison to Estimated Life Cycle Costs Last Year (as of President's FY2005 Budget Request)

Table 2 provides a comparison of life cycle cost estimates between the President's FY2005 and FY2006 Budget requests. As the table illustrates, over the last year the net change in the overall estimated life cycle costs was a reduction of $25.2 million, which is less than one quarter of one percent.

Table 2: Comparison of Estimated Life Cycle Costs for the 2010 Decennial Census Program as of President's FY2005 and FY2006 Budget Requests (nominal year dollars in millions)

Program Component	As of President's FY2005 Request	As of President's FY2006 Request	Difference
American Community Survey	$1,627.7	$1, 707.3	$79.7
MAF/TIGER Enhancements Program	$534.7	$534.3	(-$0.4)
2010 Census	$9,117.4	$9,012.9	(-$104.5)
TOTAL	$11,279.8	$11,254.6	(-$25.2)

Details may not add to totals due to rounding.

Key factors that affected our estimated life cycle costs over the last year were:

- The difference between the President's Budget request and the amount appropriated placed some constraints on the activities that could be completed in FY2005.

- For the American Community Survey program, we requested additional multi-year funding to test and evaluate alternative question wording for topics covered by the ACS questionnaire. The 2008 American Community Survey will be the first opportunity to make revisions or improvements in the questionnaire design, the questionnaire content, the question wording, or the answer categories. However, prior to implementing any such questionnaire changes, the proposed changes must be field tested in accordance with Census Bureau (and standard statistical) policy. The testing will be done through a Methods Panel beginning in 2006.

  This Methods Panel research is essential to improving the relevance and timeliness of census long-form data, which is a major objective for the 2010 Decennial Census. Further, this endeavor will be undertaken without increasing the estimated life cycle costs for the *overall* 2010 Decennial Census Program. To achieve this, we offset the ACS increase by reducing the estimated cost for the 2010 Census component. Specifically, we reduced our estimate of the amount of funding that should be in place for risk management during implementation of the 2010 Census.

Revised Estimate of Life Cycle Costs to Revert to a Census 2000 Approach

In June 2001 we estimated that the life cycle costs of a 2010 Decennial Census Program that repeated the Census 2000 approach would be $11.725 billion, while the estimated life cycle cost for the reengineered design was estimated to be $11.280 billion—a savings of $445 million.

After factoring in appropriations for FY 2002 through FY 2005, the President's budget request for FY 2006, as well as ongoing programmatic enhancements, the estimated life cycle cost for the 2010 Census now stands at $11.255 billion. Forecasted saving from the employment of the re-engineered design now are estimated to be $1.301 billion, however, because the estimated life cycle cost if we revert now to a Census 2000 design is $12.556 billion.

This illustrates that life cycle savings to be produced from the reengineered design are contingent upon preparations prior to the 2010 Census date. Therefore, cyclical costs are markedly different than what would be expected from a repeat of the 2000 methodology. Maintaining a resource level sufficient to continue with the 2010 approach is necessary to capitalize on expenditures on re-engineering made to date, and to avoid a mid-stream adjustment to the 2000 approach. Such a change would become necessary if full implementation of re-engineering is not feasible, and would result in higher-than-expected costs for the cycle as a whole.

Comparison to Previous Censuses

To provide a comparison to previous decennial census efforts, Table 3 displays life cycle costs for the previous four decades to the current estimated cost of 2010 Decennial Census Program. To standardize the comparisons, costs are shown in constant 2010 dollars(1). Table 3 also displays these figures on a unit cost basis in order to remove the effects of workload differences due to population growth.

Table 3: Life Cycle Decennial Census Program Costs 1970-2010
(constant 2010 dollars)

	1970	1980	1990	2000	2010 (estimated)
Cost in Constant 2010 Dollars [1] (in billions)	$1.0	$2.4	$3.8	$7.6	$11.4
Percentage Increase in Cost Compared to Previous Census	--	140.0%	58.3%	100.0%	50.0%
Housing Units (in millions)	70.7	90.1	104.0	117.3	130.0
Cost Per Housing Unit (in dollars)	$14.1	$26.6	$36.5	$64.8	$87.7
Percentage Increase in Unit Cost Compared to Previous Census	--	88.7%	37.2%	77.5%	35.3%

[1]All years from 1964 through 2013 inflated/deflated to constant 2010 dollars.

As the figures in Table 3 illustrate, the cost of conducting censuses increases with each subsequent cycle. Several factors that are independent of programmatic methodology contribute to this phenomenon. For example, a desire for accurate coverage of a growing and increasingly diverse population adds complexity to each census. Also, experience reveals that people have become more resistant to answering surveys and providing information to the government. Adding to these difficulties is increased immigration and its diversity of languages and cultures, which creates difficulties in maintaining a wholly inclusive census. Factors such as these lead to an expectation for increased costs for the 2010 Census over the 2000 Census, regardless of the

(1) Year 2010 dollars calculated using the Chained Price Index in the Table of Economic Assumptions contained in the Analytical Perspectives volume of the FY 2005 Budget of the United States Government.

design. However, the rate of increase in cost is estimated to slow due to the implementation of the re-engineered census design.

Table 3 reveals that the 2010 census is expected to enjoy the lowest rate of cost increase in the last four decades. This pattern also holds when comparing unit costs. To illustrate further, note that the average percentage increase in unit cost for the three previous census cycles was 67.8%. If applied to the cost for 2000, this straight line projection would produce an estimated unit cost for the 2010 cycle of $108.7, and thus an estimated total cost of $14.1 billion. And, if the largest increase in unit cost for the three previous cycles (88.7% from 1970 to 1980) were used, it would produce an estimated unit cost for 2010 of $122.3, and thus an estimated total cost of $15.9 billion. Both of these estimates are significantly higher than our actual projection of $11.4 billion as measured in constant 2010 dollars ($11.3 billion in nominal year dollars). Thus, while achieving the significant benefits to our nation from the annual release of long-form data by the ACS, and the improvements to our MAF/TIGER databases, the reengineered 2010 Decennial Census Program also will be significantly less costly than historical trends would project.

Next Steps Toward 2010

The September 2005 updated life cycle cost estimate for the reengineered 2010 Decennial Census program does not show much change from the previous estimate in June 2003, or from the initial estimate in June 2001. What has changed over the last four years is the estimated cost of abandoning the reengineered approach in favor of the approach used for Census 2000. We expect that the costs of reverting to the Census 2000 methodology will continue to increase over our current estimate of at least $1.3 billion. This amount will continue to increase as the years progress.

In addition to maintaining its cost advantage compared to historical trends, another major change over the last four years is that the reengineered approach has progressed from a plan to a reality. The American Community Survey already is producing more timely census long-form data; the Census Bureau is approaching the half way mark in bringing its TIGER database into alignment with GPS coordinates; and two major tests of 2010 Census methods and technology have been completed, with two more underway.

As these efforts proceed through the decade, the Census Bureau will continue to issue annual revisions to this document.

Overview of Plan for Reengineering the 2010 Decennial Census Program

Census 2000 was an operational and data quality success--all operations were completed on time and within overall budget; overall coverage was improved; and differential undercount was improved for all minority groups and for children. However, the 2010 Census can be conducted with greater efficiency and less operational risk, while maintaining the successes of Census 2000.

In response to the lessons of Census 2000, and in striving to better meet this Nation's ever-expanding needs for social, demographic, and geographic information, the U.S. Department of Commerce and the U.S. Census Bureau have developed a multiyear effort to completely modernize and reengineer the decennial census. This reengineering effort for the 2010 Decennial Census Program has four major goals:

- Improve the relevance and timeliness of census long-form data.
- Reduce operational risk.
- Improve the accuracy of census coverage.
- Contain costs.

The 2010 Decennial Census Program encompass three highly integrated components designed to take advantage of opportunities for innovations made possible through the expanded use of technology, major changes in our business process for data collection, and the use of focused coverage improvement procedures. These component programs complement each other and form the basis for the reengineering —each will not work to its full potential without the others.

American Community Survey

We will collect and tabulate long-form data every year throughout the decade using a large household survey.

Given the rapid demographic changes experienced in recent years, and the strong expectation that such changes will continue and accelerate, the once-a-decade data collection approach of a decennial census no longer is acceptable for producing much of the data required by the federal government, states, municipalities, tribal governments, and the Nation's businesses. To meet the needs and expectations of the Nation, one of the Census Bureau's approaches has been to develop the American Community Survey (ACS).

This survey will collect decennial census long-form data every month instead of once every ten years, and the Census Bureau will provide tabulations of these data on a yearly basis rather than only once each decade. This survey will allow the Census Bureau to remove the long form from the 2010 Census, thus providing an opportunity to restructure and greatly simplify the process of census-taking itself. In addition, the field representatives collecting the ACS data will contribute to the second activity, keeping the Master Address File (MAF) up to date during the decade.

MAF/TIGER Enhancements Program

We will conduct a multiyear effort to enhance and improve the Census Bureau's Master Address File (MAF) and geographic database (TIGER).

The MAF/TIGER Enhancements program is multifaceted—taking advantage of well established technology to improve on the outdated and error prone methodologies currently in use, while expanding geographic partnerships with state, local, and tribal governments to maintain the address and geographic information essential for a successful 2010 Census and ACS.

These improvements will help to reduce or eliminate the address duplication and incorrect housing unit and group quarters location problems that hampered Census 2000. The 2010 Census field staff will be equipped with a more comprehensive, accurate, and timely address list—one of the best predictors of a successful census. In addition, they will be provided with highly accurate geographic tools with Global Positioning System (GPS) capability to guide them to the correct units and to use in recording the locations of both new addresses and new streets.

In addition to these improvements, the program will replace the current, internally developed processing environment for the MAF/TIGER system—which is outdated and beyond its useful life—with a modern processing environment using Commercial Off-The-Shelf and Geographic Information Systems software products and sound industry standard software engineering practices.

The results of the MAF/TIGER Enhancements program also will enable the ACS to collect high quality data throughout the decade.

2010 Census

We will conduct a multiyear program of integrated planning, developing, and testing to completely restructure the management and conduct of a short-form only census in 2010.

A sustained, multiyear, integrated program for planning, testing, and developing a short-form-only census for 2010 is the third key component of our reengineering effort. The data collection effort for the 2010 Census will take advantage of and build on the ACS and MAF/TIGER improvements to contain costs and improve accuracy, while keeping operational risk to a minimum.

This will be accomplished through steps such as data collection using GPS-equipped Hand Held Computers. Use of these devices will allow us to make major improvements to our business process for data collection—the largest and most expensive component of any census. We also plan to mail a second questionnaire to households that do not respond to the initial mailout. Our research has shown this to have significant promise for increasing mail response rates, thus lowering field follow-up work loads and costs. This improvement is made possible by the replacement of the long form by the ACS.

Other key efforts will include: (1) increasing data quality for all

population groups by improving questionnaire wording and instructions when collecting data about race and Hispanic origin; (2) increasing within-household coverage for all groups and areas by improving questionnaire wording and instructions regarding our residence rules; (3) improving the way we collect data for persons who live in group quarters; and (4) reducing duplication (of persons and housing units) and conducting unduplication operations as soon as we begin to receive completed census questionnaires.

To do these things successfully, procedures must be fully tested under census-like conditions and refined well in advance of Census Day. This requires a sustained, multiyear effort of integrated planning, development, testing, revising, and retesting of all the many procedures needed to complete a successful census. Some of these preparatory activities include:

- In 2003, the Census Bureau conducted a nationally-representative mailout test to study alternative self-response options and contact strategies, and to study alternative presentations of the race and Hispanic origin questions.
- In 2004, a major field test was conducted in two locations, focused primarily on improved methodologies for data collection and coverage.
- In 2005, a second nationally-representative mailout test will be conducted to study such things as new coverage questions; wording and presentation of residence rules; design, layout, wording, and presentation of the race and ethnicity questions and other short form content; and replacement questionnaire strategies.
- In 2006, a second major field test will be conducted in two locations. This will be the final opportunity to test methods and technologies in the field before the Dress Rehearsal.
- In 2008, the Census Bureau will conduct a Dress Rehearsal field test of the selected methods and technologies selected for the 2010 Census to demonstrate final proof of design and to ensure significant reduction in the risk of operational failure in 2010.

Implementation of the ACS, completion of the MAF/TIGER Enhancements program, and development of a fully tested, redesigned plan for a short-form only 2010 Census all must occur in order for the Census Bureau to achieve its long-range performance goals for the 2010 Decennial Census Program. Each of these components can yield great benefits on its own, but the full benefit comes from the integration of these activities into a fully reengineered decennial census program.